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Back education in elementary schoolchildren: the effects of adding a physical activity promotion program to a back care program

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Abstract Promoting a physically active lifestyle whilst optimizing the spinal load at a young age seems to be advocated within the scope of early back pain prevention efforts. The present study aimed at evaluating the effects of combining a back care program with a physical activity promotion program in elementary schoolchildren. In a pre–post design over two school years, back care knowledge, back care behavior, fear avoidance beliefs and back pain reports were evaluated in children classified into three categories—those who received a back care and a physical activity promotion program ($n = 190$), those who received only a back care program ($n = 193$) and those in a control group ($n = 172$) (mean age at baseline: 9.7 years ± 0.7). Physical activity levels were evaluated in a sub-sample of 26 pupils in each group. The back care program and the physical activity promotion program were both comprehensive ones. In both intervention groups, the scores for back care related knowledge and back care behavior were significantly higher than the control group. The increase in the sum score for back care behavior was significantly higher in the back care group than in the back care plus physical activity promotion group. Significant interaction effects showed an increase in fear-avoidance beliefs between pre- and post-tests in the control group, significantly different from the better scores in both intervention groups. Interaction effects were not significant for pain reports. In the back care plus physical activity promotion group, the daily moderate to vigorous physical activity levels decreased by 8 min per day while a decrease by 31 min per day was found in the back care group and a decrease by 36 min per day in the control group. However, group differences were not significant. The present study findings favor the addition of a physical activity promotion program to a back care program in elementary schools within the scope of early back pain prevention efforts. However, the findings also emphasize the disadvantages of implementing both programs simultaneously in a school curriculum that is already full.

Keywords Non-specific low back pain · Physical activity · Prevention · Schoolchildren

Introduction

It is well established that back pain is a common and costly condition [40]. Back pain prevention efforts are mainly directed at the adult population but several authors have advocated the implementation of a primary educational prevention program in elementary school systems [3, 12, 23, 27, 42]. Schools hold enormous potential for helping students develop the knowledge and skills they need to be healthy [19] and because postural habits and body mechanics are impacted upon early in life, it seems reasonable that back education should begin during childhood [27, 36, 41]. Advantages of early back education are the possibilities of getting prolonged feedback and the large percentage of the population that can be reached. Another reason for considering back education in primary schools is the results from non-clinical studies on back pain prevalence in children, reporting mounting back pain levels in the growing child [13, 22, 23, 26, 38]. According to Burton [5], adolescent non-specific low back pain (LBP) can be considered a normal life experience, not evidently related to disabling consequences later in life. However, there is growing evidence that adolescent back pain has a predictive value on LBP as an adult [1, 17, 34] and Kjaer et al. [20] recently demonstrated that degenerative disc findings are already relatively common in childhood. Further research supports the presumption that the school environment exposes children to possible loading factors, mainly related to prolonged poor sitting postures [7, 16, 28].

While back education in schoolchildren is advocated in the literature, implementation guidelines are still sparse. Recently, a literature update search was performed within the scope of the ''COST Action B13'' of the European Commission Research Directorate General, approved for the development of European guidelines for the management of LBP [14]. However, according to the review [7], only five intervention studies in schoolchildren could be located within the scope of back pain prevention. It was shown that educational interventions in children designed to prevent LBP resulted in improved back care related knowledge or skills. Additionally, four of the five evaluated interventions found a positive effect on back pain or on the consequences of back pain, like medical consumption [3] in schoolchildren. However, it was concluded that more intervention studies are needed to allow the formulation of evidence based guidelines for the prevention of back pain in schoolchildren. Furthermore the multi-factorial character of back pain in adults may make it unrealistic to show a possible preventive effect of early interventions or risk factor modification in childhood. Hence, it may be necessary to rely on positive effects on adult risk factors and on the conclusion of the COST action B13 that the most promising preventive interventions for back pain in adults involve physical activity, exercise and biopsychosocial education programs [14].

Therefore, promoting a physically active lifestyle whilst optimizing the spinal load at young age seem to be advocated in within the scope of early back pain prevention efforts. Moreover, while children are more active than adults, evidence suggests that there is a sizeable proportion of young people who have activity levels less than those desirable for good health [4] and that physical activity declines in an individual between 8 and 18 years [4, 30–32, 39]. Furthermore, tracking studies have revealed that low levels of physical activity remain stable from adolescence to adulthood [24, 25]. Therefore, all young people should be encouraged and given opportunities to accumulate moderate to vigorous physical activity at least for 60 min a day and the importance of lifelong physical activity should be emphasized at a young age [4, 29]. An additional advantage of promoting physical activity within the scope of early back care includes the possible decrease in fear avoidance beliefs about physical activity, which are shown to be widespread in adults and play a role in the development of a long-term disability [15].

In a previously evaluated back education program, ''Be active, join sports'' was one of the ten guidelines, taught to elementary school pupils ''to make the discs happy'' [11]. However, a comprehensive physical activity promotion program was not implemented. Also, the back care programs for schoolchildren, evaluated in the literature [7], did not contain a physical activity promotion component.

Within the scope of early prevention in back pain, it can be concluded that the promotion of back care to optimize the spinal load and the promotion of physical activity are advocated in the school system. However, the effects of combining both the health promotion programs are unclear. Therefore, the aim of the present study was to evaluate the effects of adding a comprehensive physical activity promotion program to a back care program in elementary schoolchildren. Effects were studied on back care knowledge, on back care related behavior, on fear-avoidance beliefs, on back pain reports and on physical activity levels. It was hypothesized that children who received a back care program combined with a physical activity promotion program scored better than children who received only a back care program. Furthermore, as expected both intervention groups did better on all outcome measures compared to the control group.

Materials and methods

Study participants

The population assessed in the present study comprised fourth- and fifth grade elementary schoolchildren (mean age at baseline: 9.7 years ± 0.7, range 8.1–12.0). Thirty

one class groups of 12 public schools pupils were randomly selected in Flanders. A total of 603 pupils (289 boys and 314 girls) were evaluated at baseline. Participating schools were randomly assigned to a condition receiving a back care and a physical activity promotion program (four schools; 205 pupils), a back care promotion condition (four schools; 213 pupils) and a control condition (four schools; 185 pupils). Between pre- and post-tests (interval 17–18 months) there was a dropout of 48 pupils (8%) caused by transfers to other schools or due to absenteeism on the day of testing. As a result, 555 pupils were evaluated before and after the intervention. The group combining back care with physical activity promotion consisted of 190 pupils, the back care group consisted of 193 pupils and the control group comprised 172 children.

The evaluation methods and coding systems from prior studies were used [10, 11]. The evaluation consisted of an observation of back care behavior during a movement session, a questionnaire on back care knowledge, fear-avoidance beliefs and back pain reports and accelerometer data of 1 week. Due to practical limitations, accelerometer data were only obtained in a randomly assigned sub sample of 26 children (13 boys and 13 girls) of each group. Informed consent forms were signed by all parents. The study protocol was approved by the Ethical Committee of the University Hospital of Ghent University.

Procedure

Pre-tests were performed at the beginning of the first school year, between September and October 2002; post-tests at the end of the second school year, between April and June 2004. All tests were carried out at school, under the supervision of research staff members. Testing consisted of a posture observation to evaluate back care behavior during a movement session and a questionnaire. The movement sessions were filmed and coded afterwards blindly by trained research staff members. The children completed the questionnaires at school under the supervision of their class teacher. Additionally, accelerometer data were obtained in a sub sample. The pupils were familiarised with the accelerometer and requested to wear the accelerometer for five consecutive days during waking hours, removing the monitor only for water based activities and sleeping. The children were also asked to record each activity performed without wearing the accelerometer (e.g. swimming, showering, contact sports), including the duration and the intensity. An accelerometer instruction form for the parents was included to ensure correct accelerometer usage. After 1 week, accelerometers and recording forms were collected at school.

The back care promotion program and the physical activity promotion program were both comprehensive programs including individual educational components and environmental changes.

Interventions were implemented over the two school years, between the pre and the post-test. The main components of both programs, consisting of six educational sessions, were implemented within 2 months after pre-testing. The sessions were integrated into the regular curriculum, resulting in no extra lesson load for the children. Based on prior study findings, the main components of both programs were taught by an external expert, while the repetition and the integration of the learned principles into the daily classroom routine were assigned to the teachers.

Interventions

The back care promotion program

The back care promotion program of the present study was based on prior studies [8–11]. The main part consisted of six lessons on back education taught by a physical therapist with a 1-week interval. In the context of loading the body structures optimally, children were taught basic anatomy and pathology of the back and the basic principles of biomechanical favorable postures during standing, sitting, lying, lifting, pushing and bending. The back care principles were ‘translated’, making them easy to understand and attractive for the children through the use of games, much material and the introduction of two comic characters ‘Fit Fred’, who does everything right, and ‘Lazy Leo’, who ‘makes his discs very unhappy’ by being very lazy and doing everything wrong. Based on a prior study [9], in the current intervention program class teachers were given guidelines to integrate the learned principles into the daily classroom routine. Additionally, based on previous research [8] class teachers were given guidelines to increase postural dynamics in the classrooms (like giving movement breaks and using variable work organizations) and each participating class received two pezzi balls, a dynair and a sitting wedge. During the transition to the next grade, all supporting materials stayed with the class group. A research staff member explained the program to the class teachers at the start of both school years and additionally each class teacher was visited twice to motivate as well as check its implementation.

The physical activity promotion program

The aim of the comprehensive program was to promote physical activity inside and outside school and to develop

an active lifestyle. The main part of the physical activity promotion intervention was implemented at a 1-week interval by a research staff member and consisted of six lessons on self-management, based on the classroom component of Sports, Play, and Active Recreation for Kids (SPARK) of San Diego State University [33]. The aim of these lessons was to enhance their knowledge and to develop and maintain an active lifestyle by teaching skills including goal setting, time planning, problem solving and self-talk. Additionally, the physical education teachers were given didactic guidelines, including example lessons, by a research staff member to increase physical activity levels during physical education lessons based on the physical education component of SPARK [33]. Furthermore, during both the school years, one extra-curricular sports session was implemented every week in each participating class by an external physical education specialist. Finally, each participating class received a package of sporting materials to be used during recess and lunch break. During the transition to the next grade, all supporting materials stayed with the class group. A research staff member explained the program to the class teachers at the start of both the school years and each class teacher was visited twice to motivate as well as check its implementation.

Evaluation instruments

Observation during a movement session

To evaluate if pupils used the back care principles that they had learned, back care behavior was evaluated during a movement session, based on previous research [11]. The children were not told about the evaluation. The session was presented as an evaluation of throwing and catching skills. A verbal awareness check after finishing the observations showed that the pupils were not aware of the purpose of the movement sessions.

The organization of the movement session made it possible to evaluate the use of learned back care principles during lifting, transferring and putting down a heavy object (bench), picking up a light object from the floor (shuttle) and moving a heavy object (medicine ball). Movement sessions were videotaped and tapes were blindly coded afterwards, with frequent use of the slow motion and repeat modes.

Questionnaire

To evaluate back care knowledge, fear-avoidance beliefs and 1-week prevalence of back pain, a questionnaire from previous research in 9 to 11-year olds was used [10, 11]. The children completed the questionnaire at school under the supervision of their class teacher.

One-week prevalence was defined as the occurrence of pain or discomfort, continuous or recurrent, at some point in the past week. The children were told that pain or discomfort due to fatigue related to a single exercise was not considered as a back pain problem.

Accelerometer

Usage of accelerometers has been shown to be a valid, reliable and objective method for monitoring PA in children in field settings, when 4 or more days of activity are taken into account [18, 21]. In the present study, the MTI Actigraph model 7164 (Manufacturing Technologies Inc., Shalimar, FL) was used. The MTI Actigraph is small (5×4×1.6 cm), lightweight (37.5 g) and unobtrusive to wear. It is a uniaxial accelerometer designed to measure and record time varying vertical accelerations ranging in magnitude from 0.05 to 2 Gs, with a frequency response ranging from 0.25 to 2.5 Hz. These frequencies were chosen to detect normal human motion and to reject motion from other sources. For the present study, a 1-min sampling interval was used, based on the literature [18, 39]. The 1-min movement counts were stored in memory for 7 days, downloaded into a personal computer and converted into an Excel file for subsequent analyses. Monitors were worn just above the right hipbone underneath clothes and were held in place by an elastic belt. The accelerometer data were reduced with custom software. Minute-by-minute movement counts were summed for each day and daily movement counts were summed into total week activity counts. To convert the total weekly activity counts into moderate (3.0–5.9 METs) and vigorous activity (> 6.0 METs) the child count cutoffs of Trost et al. [39] were used.

Data analysis

Data analysis was performed using SPSS for Windows (12.0). To compare intervention effects between the back care with physical activity promotion condition, the back care condition and the control condition, repeated measure ANCOVAs with post-hoc Tukey HSD were used with time (pre-test, post-test) as within subjects factor, condition as between subjects factor and age as covariate. A significant interaction effect revealed that significant differences were found between the three conditions in the evaluation of the scores between pre- and post-test. Results were defined as significant at $P < 0.05$.

Results

Mean scores of the back care plus physical activity promotion group, the back care group and the control

Table 1 Mean post- and pre-test scores in the back care plus physical activity promotion group (back + PA), the back care group (back) and the control group (control) for back care knowledge, back care behavior, fear-avoidance beliefs, back pain prevalence and daily moderate to vigorous physical activity (MVPA) engagement and *F*- and *P*-values for interaction effects (time × condition).

	Pre-test			Post-test			*F* Time × condition
	Back + PA	Back	Control	Back + PA	Back	Control	
Back care knowledge (range: −11 to +11)	1.4 ± 3.3	1.0 ± 3.9	0.7 ± 3.4	5.2 ± 2.7[a]	5.1 ± 2.9[a]	2.7 ± 3.0	10.88***
Back care behavior (range 0–36)	18.3 ± 5.06	17.36 ± 4.82	16.46 ± 4.20	21.8 ± 5.31[a]	25. 44 ± 4.66[a, b]	18.48 ± 5.43	38.64***
Back position while lifting bench (0–4)	0.79 ± 1.11	0.99 ± 1.2	0.60 ± 0.9	2.17 ± 1.53	3.01 ± 1.1[a, b]	2.5 ± 1.3	7.24***
Knee bending while lifting bench (0–4)	1.78 ± 1.22	1.65 ± 0.97	1.58 ± 1.08	2.57 ± 1.40[a]	3.10 ± 1.25[a]	1.85 ± 1.26	18.16***
No twisting while lifting bench (0–4)	3.70 ± 0.91	3.34 ± 1.23	3.52 + 1.08	3.90 ± 0.44[a]	3.64 ± 1.00[a, b]	3.35 ± 1.35	4.19*
Body posture while moving bench (0–4)	3.03 ± 1.46	3.10 ± 1.29	2.98 ± 1.46	3.57 ± 0.85[a]	3.81 ± 0.63[a]	3.11 ± 1.17	4.64**
Knee bending and back position while putting down bench (0–4)	1.77 ± 1.23	1.51 ± 1.29	1.28 ± 1.19	2.08 ± 1.55[a]	2.78 ± 1.36[a]	1.06 ± 1.39	27.45***
No twisting while putting down bench (0–4)	3.56 ± 1.26	2.91 ± 1.78	3.35 ± 1.49	3.58 ± 1.22[a]	3.85 ± 0.77	3.14 ± 1.65	14.12***
Picking up light object	2.19 ± 1.01	2.25 ± 1.00	2.00 ± 0.96	2.00 ± 0.81[a]	2.51 ± 0.83[a, b]	2.20 ± 0.96	6.80***
Knee bending while lifting heavy object (0–4)	0.60 ± 1.33	0.64 ± 1.14	0.45 ± 1.04	0.69 ± 1.43[a]	1.23 ± 1.77[a, b]	0.25 + 0.93	7.35***
No twisting while moving heavy object (0–4)	0.91 ± 1.43	0.96 ± 1.25	0.74 ± 1.27	1.27 ± 1.16	1.54 ± 0.99[a, b]	1.00 ± 1.06	1.33 (NS)
Fear-avoidance beliefs (range: 0–20)	11.04 ± 5.16	12.01 ± 4.95	12.13 ± 4.76	12.77 ± 4.72[a]	11.46 ± 4.01[a]	11.90 ± 4.37	4.46**
When your back hurts, it's dangerous to swim (0–4)	2.16 ± 1.19	2.71 ± 1.27	2.52 ± 1.16	2.95 ± 1.12	2.06 ± 1.24	2.33 ± 1.11	2.29 (NS)
When your back hurts, you have to sit still (0–4)	2.17 ± 1.28	2.55 ± 1.19	2.61 ± 1.11	2.34 ± 1.12	2.27 ± 1.19	2.22 ± 1.41	4.9**
When your back hurts, you should not run (0–4)	2.49 ± 1.19	2.41 ± 1.03	2.49 ± 1.19	2.56 ± 0.99	2.48 ± 1.02	2.63 ± 1.03	0.13 (NS)
When your back hurts, you should not participate in physical education (0–4)	2.07 ± 1.14	2.19 ± 1.08	2.27 ± 1.18	2.36 ± 0.95	2.31 ± 1.08	2.34 ± 1.03	1.46(NS)
When your back hurts, you should not bike (0–4)	2.15 ± 1.15	2.15 ± 1.16	2.24 ± 1.25	2.56 ± 1.03	2.34 ± 1.16	2.38 ± 1.12	1.6 (NS)
Back pain prevalence (%)	28	31	31	27	30	34	0.34 (NS)
MVPA engagement (minutes per day)	140 ± 50	157 ± 32	159 ± 30	132 ± 52	126 ± 32	123 ± 35	4.46**

NS not significant
[a]Evolution significantly more positive than in the control group
[b]Evolution significantly more positive than in the back care plus physical activity promotion group
*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$

group at pre- and post-test can be found in Table 1. Significant interaction effects were found for back care knowledge, for back care behavior, for fear-avoidance beliefs and for physical activity levels. In the back care group and in the back care plus physical activity promotion group, the scores for back care related knowledge were significantly higher than the control group. However, the scores of both intervention groups did not change significantly between the pre- and post-tests.

The back care behavior scores of both intervention groups were significantly higher than the score of the control group. According to the post-hoc analyses, the increase in the sum score for back care behavior was significantly higher in the back care group than in the back care plus physical activity promotion group. A significantly higher score increase in the back care group compared to both the other groups was found for back position while lifting a bench, for no twisting while lifting, for picking up a light object, for knee bending while lifting a heavy object and for no twisting while moving a heavy object.

For fear-avoidance beliefs, a significant interaction effect showed an increase in fear-avoidance, reflected by a lower score between pre- and post-test of the sum score in the control group significantly different from the evolution in fear-avoidance in both intervention groups. However, scores did not change significantly in both intervention groups. Back pain prevalence rates ranged from 27 to 34%. Interaction effects were not significant for pain reports.

On the other hand, a significant interaction effect was found for physical activity levels. In the back care plus physical activity promotion group the daily moderate to vigorous physical activity levels decreased by 8 min per day, while a decrease by 31 min per day was found in the back care group and a decrease of 36 min per day in the control group. However post-hoc Tukey testing revealed no significant group differences.

The age of the children did not significantly influence the results (back care knowledge: F: 0.776, P: 0.38; back care behavior: F: 0.001, P: 0.98; fear-avoidance beliefs: F: 0.790, P: 0.37; back pain prevalence: F: 0.032, P: 0.86; MVPA engagement: F: 0.001, P: 0.97).

Discussion

The aim of the present study was to evaluate the effects of adding a physical activity promotion program to a back care program in elementary schoolchildren on back care knowledge, on back care related behavior, on fear-avoidance beliefs, on back pain reports and on physical activity levels.

An important finding of the present study is that in the group of pupils, who received only the back care intervention, the use of the learned back care principles improved more than in the children, who additionally received a physical activity promotion program. This was observed in five of the nine evaluated items. Since many elementary school teachers do not have sufficient background to teach these materials [3, 9], the main parts of both health promotion programs were implemented by an external expert while the repetition and the integration of the learned principles were assigned to the teachers. The fact that back care behavior scores improved less in pupils who received both programs than in children involved only in the back care program, can possibly be explained by the fact that the implementation of both programs simultaneously may have resulted in less time or efforts allocated to the integration and repetition of the back care principles by the teachers. This is in line with our prior study findings [9] and the literature [3, 10, 41] emphasizing the complementary role of the class teacher to implement the principles of an external back care program and highlighting the difficulty in convincing teachers to add new material to an already full curriculum. Furthermore, the combination of the two comprehensive health promotion programs may have resulted in less attention of the pupils for some program components.

On the other hand, the increase in back care knowledge did not differ between both intervention groups. Possibly the elementary school teachers were more motivated or found it easier or less time consuming to repeat the cognitive aspects of back care than to enhance the use of the principles since the combination with a physical activity promotion program did not influence the knowledge scores.

Furthermore, the present study findings confirm our prior study findings [10, 11] that elementary schoolchildren are receptive to back care knowledge and skills. Moreover, our prior study included a follow-up over one school year, while in the present study increased scores for back care knowledge and behavior were retained over two school years. Since all participating classes had different teachers during the second school year of the intervention, it can be concluded that knowledge and behavior was well retained and probably also repeated and integrated by the teachers during the second school year.

In line with our hypothesis, adding a comprehensive program to promote physical activity was more favorable for physical activity levels than only implementing a back care program without additional efforts to promote physical activity. The present findings also show that merely teaching pupils that being active is important without a comprehensive physical activity promotion program has no effect on the physical activity levels. In line with the literature showing a decrease in physical activity levels from the age of 8 years [4], in all groups, a decline in physical activity levels was found during the two school years. However,

the decline was lower in the physical activity promotion group. In the back care plus physical activity promotion group the daily moderate to vigorous physical activity levels decreased by only 8 min per day, while a decrease of 31 min per day was found in the back care group and a decrease of 36 min per day in the control group. In our opinion, the fact that in the present study group differences were not significant need to be attributed to a lack of power since, due to practical limitations, only in a limited group accelerometer data could be obtained. However, the limited sample requires cautious interpretation of the results on physical activity levels.

While there are many arguments to justify back education in schoolchildren, Burton et al. [6] argued that the risk exists that early back education results in increased fear-avoidance beliefs about physical activity and reinforces an erroneous belief that there is something seriously amiss. In the present study, fear-avoidance beliefs changed more favorably in both intervention groups compared to the control group. However, in the present study, adding a physical activity promotion program to the back care program did not influence the evolution of fear-avoidance beliefs. The present positive findings are in line with prior study findings [11] showing that pupils who followed back education did not have higher fear-avoidance beliefs than controls. The findings show that the evaluated program did not reinforce fear-avoidance, probably due to the active approach not focusing on pain. Therefore, it can be concluded that misconceptions about back pain, which are shown to be widespread in adults and play a role in the development of long-term disability [15], can possibly be prevented by carefully selected and presented health promotion programs in children with the merit of demedicalizing LBP.

Accordingly, in the present study following a back care program did not increase back or neck pain reports. The prevalence rates of back and neck pain, found in the present study, were in line with prevalence numbers in previous research [11] and in the literature [37], evaluating children of the same age group. Moreover, in the present study, the prevalence of back and neck pain increased in the control group (from 31 to 34%), while a decrease was found in both intervention groups (from 31 to 30% in the back care group and from 28 to 27% in the back care plus physical activity group). However, the group differences were not significant. The fact that the interventions in the present study did not result in increased pain reports is a positive finding. However, since feeling pain is a subjective phenomenon and since children are in the middle of a learning process in experiencing their body and reporting their aches [2], results on back pain prevalence need to be interpreted with caution. Moreover, one could question if self-reported back or neck pain is the right outcome measure of a back education program in elementary schools. In our opinion, it is useful to evaluate pain reports in order to avoid a possible increase in reports, caused by increased awareness. However, within the scope of back pain prevention spinal load, back care behavior and knowledge and physical activity levels deserve priority in program evaluation.

From different health perspectives, it is justified to combine a physical activity promotion program with a back care program. In the same line, the present study findings favor adding a physical activity promotion program to a back care program in the highest grades of elementary school in the scope of early back care. However, the findings also emphasize the disadvantage of implementing both programs in school curriculum that is already full. Even when the main part of the health promotion program is taught by an external expert, attention needs to be paid towards the teachers, who are assigned the job of implementing the health education programs. Furthermore, it needs to be taken into account that class teachers acknowledge a lack of expertise in health matters. A possible solution could be a consecutive implementation of the main part of both health promotion programs in the fourth and fifth grades of elementary school. According to Seefelt et al. [35] the transition from childhood to puberty with its biological and social implications is an important intervening step for physical activity transition from childhood to adulthood. In the same line, pre-adolescence seems a good age for the implementation of a back education program since an increase in back pain prevalence is found during adolescence. Moreover, health education seems easier to organize in elementary school, which has a more flexible system than secondary school. Therefore, the last grades of elementary should be focused on these health promotion programs.

As recommended by Balagué et al. [3], it may be useful to incorporate back care education in the professional course of studies in the training of future primary school teachers enabling them to implement the principles in their daily work and to enter into a professional career with a positive attitude toward prevention and more confidence to deliver the information. Moreover, health education should become a more extensive part of the elementary school curriculum instead of a component, in addition to an already full curriculum. However, further study with a follow-up into adulthood is needed to evaluate to what degree the risk for adult LBP can be altered by early interventions.

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